CLOSURE ESPECIALLY FOR RECEIVING OR CLAMPING A FOLDED PART OF A BAG

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Inventor: SCHOEREN HUBERTUS JOHANNES BER (NL)
Applicant: SCHOEREN HUBERTUS JOHANNES BER (NL)
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Abstract of **WO0007896**

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(71)(72) Applicant and Inventor: SCHOEREN, Hubertus, Johannes, Bernardus [NL/NL]; Sleggeplantsoen 26, NL-6835 AJ Arnhem (NL).

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(57) Abstract

Closure made of plate material comprising a first closing part (1) provided with an opening (1a) cut through the material of the closure. The closure comprises a second closing part (2) movable with respect to the first closing part (1), whereby an edge part (3a) of the opening (1a) of the first closing part (1) in co-operation with an edge part (3b) of the second closing part (2) may enclose a hole (3). The closure further comprises connection means (4, 5 or 6) for the transferral of force between the two said closing parts (1 and 2).

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CLOSURE ESPECIALLY FOR RECEIVING OR CLAMPING A FOLDED PART OF A BAG

The invention is related to a closure made of plate material according to preamble of claim 1. Such a closure is known from the United States patent publication US-A-3.822.441 and is suited for closing and/or clamping of objects made of a flexible material, such as bags made of plastic and/or bath towels and the like. In the known closure a recess cut through the plate material of the closure consists of three parts, which are characterised by their shape. The first part of the recess starts from the edge of the closure and has an inwardly converging shape. The second part of the recess is a relatively narrow passage, which connects to the narrow side of the first part of the recess. The narrow passage ends in the third part of the recess, which consists of an opening the edges of which are provided with number sharp protrusions. When the first part of the recess of the closure is pushed against a folded part of the object to be closed and/or clamped, the said folded part will be guided to the narrow passage, whereby the said folded part is folded together further. Subsequently the said folded part can be brought through the narrow passage to the third part of the recess, where by the plate material of the closure somewhat deforms elastically. The edges of the opening then clamp the said folded part, there by aided by the sharp protrusions. Because the closure prohibits the tendency to fold out of the said folded part of the object to be closed and/or clamped, the said object is closed and/or clamped.

Although the known closure functions well in itself, a number of disadvantages are connected to the known closure. After the known closure is attached to an object it is not well possible to remove it again. Moreover the material from which the known closure is composed is a somewhat elastically deformable. Such materials are relatively expensive and are very poorly biologically degradable. Furthermore the known closure can not be re-used easily for carrying objects. During the carrying of an object at the closed end of the closure, gravity works in the direction of said recess, so that under the influence of its weight the said object will slide out of the closure or will be damaged by the said sharp protrusions.

The invention aims at overcoming the afore said disadvantages. To this end the closure is defined according to the characterising portion of claim 1. According to the invention the closure comprises to mutually moveable closing parts. A first closing part is provided with an opening cut through the material of the closure for receiving a folded part

of an object to be closed and/or clamped. The closure further comprises a second closing part, which is movable with respect to the first closing part. The second closing part may thereby be placed in to such a position with respect to the first closing part that this closing part in co-operation with the first closing part encloses a hole, which coincides with a part of the opening of the first closing part. In the said position the freedom of movement of the said folded part is restricted to the hole enclosed by the two closing parts and the closure is in the closed state. The size of the hole is tuned such to the volume of the said folded part that this is clamped with a certain clamping force. Connection means are present for the transferral of force between the two closing parts. In general the said force is a reaction force due to the clamping force which the two closing parts exert on an object to be closed and/or clamped.

The closure according to the invention may be used repeatedly without damaging the closure or the object to be closed and/or clamped. Moreover, besides plastic the closure according to the invention may be made of the durable and biologically well degradable cardboard without compromising the functionality of the closure. A additional advantage of the closure according to the invention is that this may simply be provided with a handle or hook by the introduction of at least one further opening cut through the material of the closure. Such a handle may be introduced in the material of the closure such that during the carrying of an object the gravitational force works in the direction of an edge part of the opening of the first closing part. In such a case it is prevented that the closures opens because of the weight of the said object. Moreover, the clamping force between the closure and the said object will even increase during the carrying of an object. During the carrying of an object by means of the closure, the closure is usually held vertically in line with the arm. Because the closure is attached to an object to be closed and/or clamped while held approximately vertically at an angle of approximately 90°, the said object would assume a horizontal position. Under the influence of the force of gravity the said object usually will try to assume a vertical position, so that the said object tilts in relation to the closure. As a result of the tilting the object exerts a force moment on the closure, which moment advantageously contributes to the clamping of the said object.

According to an elaboration of the closure according to the invention the connection means comprise an at least in the closed state of the closure raised edge, that is provided on one of the two closing parts. If the said raised edge is provided on the first closing part, this

raised edge needs to be provided such that in the said position the second closing part is enclosed between the said raised edge and the said folded part. According to a further elaboration of the invention the first closing part to this end is composed of two essentially mutually mirror image like made parts that are connected to each other by means of at least one folding line. Before use of the closure the said two parts of the first closing part are folded-over along the folding line, whereby a part of the material of the first closing part near the folding line forms the raised edge.

According to an alternative elaboration of the closure according to the invention the connection means comprise a folding line. The first closing part may then rotate with respect to the second closing part along an axis formed by the folding line and be brought into the said position. According to yet another elaboration of the closure according to the invention the connection means comprise a shaft oriented substantially perpendicular to the said two closing parts. The first closing part may then be brought into the said position rotating with respect to the second closing part along the said shaft. The said shaft is for example composed of a cotter pin.

A more detailed elaboration of the closure according to the invention is provided by the characterising portion of claim 6. Because before the closing of the closure the closing parts are brought into a substantially parallel orientation with respect to each other, the closure is relatively flat in the closed state and has a laminated structure, whereby the closing parts mutually support each other. The mentioned features of the closure contribute to the stiffness, the strength and the ease of use of the closure. In the closed state of the closure the second closing part covers a part of the opening of the first closing part. Because of this the said opening may be made relatively large, so that the opened state of the closure the said folded part of an object to be closed and/or clamped may be guided through the opening easily. If the said opening converges in the direction of the said edge part, the said folded part is compressed when this is moved in the direction of the said edge part before the closing of the closure.

Preferably, the hole enclosed by the two closing parts is essentially circularly shaped in the closed state of the closure. In such a case the said folded part of the object to be closed and/or clamped is enclosed and clamped by the two closing parts evenly. To this end edge parts of the first closing part and of the second closing part, that enclose the said hole in the closed state of the closure, are curved with an essentially constant radius of

curvature. According to a more detailed elaboration of the closure according to the invention the said edge parts are provided with one or more sharp protrusions. In the closed state of the closure the sharp protrusions are in touching with the said folded part, so that the clamping of this folded part is at an optimum.

Although in the above the bringing into contact of a folded part of an object to closed and/or clamped is discussed, it was found that the closure according to the invention may also be adopted for the clamping and if the closure is provided with a handle subsequently carrying of inflexible objects such as glass or plastic bottles. In such a case the flexibility of the material of the closure is sufficient for exerting an indeed small clamping force on the object to be clamped. During the carrying of the object it will tilt with respect to the closure, as is discussed in the above. Because of the tilting the said object exerts a push force on the closure, which contributes to the clamping of the object in the closure.

In the below a number of elaborations of the closure according to the invention are discussed with reference to the figures. In the figures de solid lines denote the edges of and the cuts in the plate material of the closure. De dash-dotted lines denote the folding lines and the dashed lines denote the cuts, edges and folding lines that are located under an on top lying closing part. The arrows that are shown in a number of the figures denote the direction in which the second closing part is moved with respect to the first closing part for the closing of the closure.

Figure 1a is an opened closure according to the invention provided with a folding line.

Figure 1b is the closure according to figure 1a in the closed state.

Figure 1c is de opened closure of figure 1a seen at a different angle

Figure 1d is the closed closure of figure 1b attached at the location of a folded part of a bag made of a flexible material.

Figure 2a is an opened closure according to the invention provided with a raised edge.

Figure 2b is the closure of figure 2a in the closed state.

Figure 3a is an opened closure according to the invention provided with a shaft.

Figure 3b is the closure of figure 3a in the closed state.

Figure 4a is an opened closure according to the invention provided with a folding line and with connection means.

Figure 4b is the closure of figure 4a in the closed state.

Figure 5a is a closure according to the invention wherein plate material is made use of efficiently.

Figure 5b is the closure of figure 5a in the closed state.

Figure 6a is an opened closure according to the invention provided with double fitted second closing part.

Figure 6b is yet another opened closure according to the invention provided with a double fitted second closing part.

Figure 7 is the opened closure of figure 1a provided with sharp protrusions.

Figure 8 is an opened closure according to the invention with a deviating design.

The figure 1a shows an opened closure according to the invention comprising a first closing part 1 provided with an converging opening 1a cut through the plate material of the closure and a second closing part 2 provided with a further opening 2a cut through the plate material of the closure, which serves as a handle in the closed state of the closure. The two closing parts 1 and 2 are movably connected to each other by means of connection means 4, 5, or 6 executed as a folding line 5. The edge arts 3a of the first closing part 1 and 3b of the second closing part 2, which in the closed state of the closure enclose a hole 3, are curved with a substantially constant radius of curvature. Part 10 of the first closing part 1 is parted from the rest of the material of the first closing part 1 by means of a folding line and serves as reinforcement in the closed state of the closure. Part 10 is not in all cases essential to the correct functioning of the closure.

In figure 1b the closure of figure 1a is shown in the closed state. In the closed state the closing parts 1 and 2 are folded against each other, whereby the two closing parts 1 and 2 largely coincide and in co-operation with each other enclose a hole 3. As is shown in figure 1b, in the closed state of the closure the further opening 2a in co-operation with the opening 1a of the first closing part 1 forms a further hole, that may for example be utilised as a handle. The part 10 of the first closing part 1, which is attached to the first closing part 1 by means of a folding line, may be folded around the second closing part 2 in the closed state of the closure for the strengthening of the plate material about the handle.

In figure 1c the closure of figure 1a is shown in a half closed state. In figure 1d the closure figure 1a is shown, adopted for the closing of a bag 8 of flexible material. The closing of such a bag 8 with the aid of the closure according to the invention may be

performed in four steps. In a first step the upper side of the bag 8 is folded together, for example by rotating said upper side a number of times with respect to the lower side of the bag 8. In a second step the folded upper side of the bag 8 is brought through the opening 1a of the first closing part 1. In a third step the first closing part is moved with respect to the bag 8 such that a part of the said upper side is pushed against the edge part 3a. Although not essential for the functioning of the closure, it may be evident that the converging shape of the opening 1a has the advantage that the upper side may be brought into the opening 1a easily and that during the moving of the said upper side in the direction of the edge part 3a it is compressed and clamped into the narrow part of the opening 1a. Finally, in the fourth step the second closing part 2 is folded over the first closing part 1 with the aid of the folding line 5, so that also the edge part 3b starts to push against the said folded part of the upper side of the bag 8. In the closed state of the closure a part of the upper side of the bag 8 is in this manner clamped by the hole 3 enclosed by the edge parts 3a and 3b. The lower side of the bag 8 is then closed of by the closure. It will be clear that the size of the hole 3 must be tuned to the side of the bag 8 to obtain the right amount of clamping force on the folded upper side.

The figure 2a shows an opened closure according to the invention comprising a first closing part 1 provided with an opening 1a cut through the plate material of the closure and with a second closing part. The first closing part 1 consists of two mutually mirror image like made parts that are connected to each other by means of a pair of folding lines 5. At least in the closed state of the closure the material in between the folding lines 5 forms a raised edge 4. Before use of the closure the two said parts of the first closing part 1 are folded-over along the folding line 5. After the folded part of an object to be closed and/or clamped is brought into the opening 1a, the second closing part slides in-between the two said part of the first closing part 1, whereby the second closing part 2 abuts the said raised edge 4. After the second closing part is attached, the two closing parts 1 and 2 enclose and hole 3, as is shown in figure 2b.

The figure 3a shows an opened closure according to the invention comprising a first closing part 1 provided with an opening 1a cut through the plate material of the closure and with a second closing part 2. The two closing parts 1 and 2 are rotatably connected to each other by means of a shaft 6. In figure 3b the closure is shown in the closed state, wherein the closing parts 1 and 2 in co-operation with each other enclose a hole 3. In the elaboration

of the closure according to the invention shown in the figures 3a and 3b the part 10 prevents the rotation of the closing part 2 in the direction wherein the closure opens.

The figure 4a shows an opened closure according to the invention comprising a first closing part 1, a second closing part 2 and clamping parts 1b and 2b for the fixing of the closing parts 1 and 2 with respect to each other. The first closing part 1 is provided with a clamping part 1b and the second closing part 2 is provided with a clamping part 2b. The two closing parts 1 and 2 are connected to each other by means of a folding line 5. In figure 4b the closure is shown in this closed state, wherein the two closing parts 1 and 2 are oriented mutually substantially parallel and enclose and hole 3. The clamping part 1b of the on top lying first closing part 1 is brought under the clamping part 2b of the under lying second closing part 2, so that the two closing parts 1 and 2 are fixed with respect to each other in the closed state of the closure.

De closure shown in figure 5a is advantageously made of a small amount of plate material. The closure comprises a first closing part 1, a second closing part 2 and a part 10, which parts 1, 2 and 10 are parted from each other by a number of folding lines 5 and cuts 9. In figure 5b the closure of figure 5a is shown in the closed state, wherein the closing parts 1 and 2 enclose a hole 3.

The closures shown in figure 6a and 6b comprise a first closing part 1 and a second closing part having two parts 11 and 12. The two parts 11 and 12 of the second closing part 2 are connected to either side of the first closing part 1. Such a closure has the advantage that the opening 1a of the first closing part 1 may be open to the outside, so that the attaching of the closure to an object to be closed and/or clamped may be performed easily. Moreover, the closure comprises three layers of plate material in the closed state, which comes to the advantages of the stiffness and strength of the closure.

In figure 7 the closure of figure 1a is shown, whereby the said edge parts 3a and 3b of the closing parts 1 and 2 are provided with sharp protrusions to optimally close and/or clamp an object to be closed and/or clamped.

Finally in figure 8 yet another elaboration of the closure according to the invention is shown having a second closing part having two parts 11 and 12. The closure of figure 8 has in the shown opened state a substantially rectangular shape so that this may advantageously be made of rectangular base material.

CLAIMS

1. Closure made of plate material comprising a first closing part (1) provided with an opening (1a) cut through the material of the closure, characterised in that, the closure comprises a second closing part (2) movable with respect to the first closing part (1), whereby an edge part (3a) of the opening (1a) of the first closing part (1) in co-operation with an edge part (3b) of the second closing part (2) can enclose a hole (3), and in that the closure further comprises connection means (4, 5 or 6) for the transferral of force between the two said closing parts (1 and 2).

2. Closure according to claim 1, characterised in that, the closure is provided with at least one further opening cut through the material of the closure.

3. Closure according to claim 1 or 2, characterised in that, the connection means (4, 5 of 6) at least in the closed state comprise a raised edge (4).

4. Closure according to claim 1, 2 of 3, characterised in that, the connection means (4, 5 of 6) comprise a folding line (5).

5. Closure according to claim 1 or 2, characterised in that, the connection means (4, 5 or 6) comprise a shaft (6).

6. Closure according to claim 5, characterised in that, the shaft (6) is a folding line (5).

7. Closure according to any one of the preceding claims, characterised in that, the second closing part (2) may at least be brought into a substantially parallel orientation with respect to the first closing part (1), whereby the plate material of the second closing part (2) at least partly covers the recess (1a) of the first closing part (1).

8. Closure according to any one of the preceding claims, characterised in that, the opening (1a) of the first closing part (1) at least partly converges in the direction of the said hole (3).

9. Closure according to any one of the preceding claims, characterised in that, the said edge part (3a) of the opening (1a) of the first closing part (1) is curved with an essentially constant radius of curvature.

10. Closure according to any one of the preceding claims, characterised in that, the said edge part (3b) of the said second closing part (2) is curved with an essentially constant radius of curvature.

11. Closure according to any one of the preceding claims, characterised in that, the said edge parts (3a and 3b) are provided with at least one sharp protrusion (7).

12. Closure according to any one of the preceding claims, characterised in that, the first closing part (1) and the second closing part (2) comprise a clamping part (respectively 1b and 2b), whereby the first closing part (1) can be brought into a substantially parallel orientation above the second closing part (2) and whereby the clamping part (1b) of the first closing part (1) may be positioned under the clamping part (2b) of the second closing part (2), for the fixing of the two closing parts (1 and 2) with respect to each other.

13. Closure according to any on of the preceding claims, characterised that, the plate material is made of cardboard.

14. Closure according to any on of the preceding claims, characterised in that, the plate material is made of plastic.

15. Bag (8) or holder made of a flexible material and provided with a closure according to any one of the preceding claims.

16. Plate material at least provided with a hole (3), a folding line (5) and a cut (9), characterised in that, the plate material comprises a closure according to any one of the preceding claims.

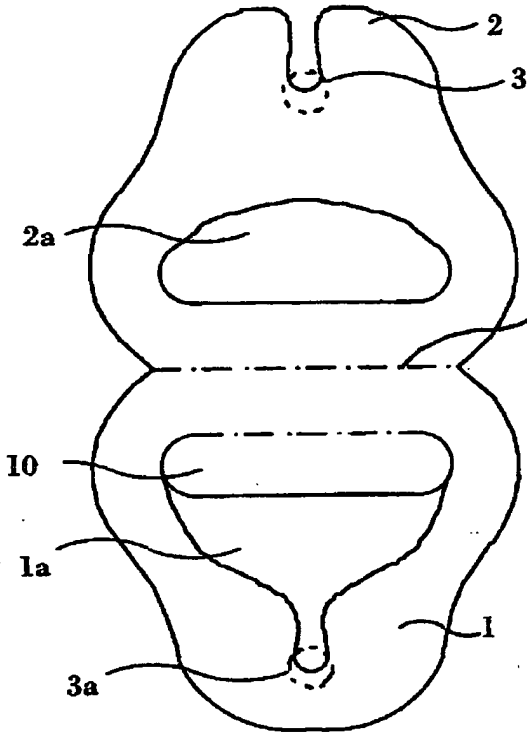

FIG.1A

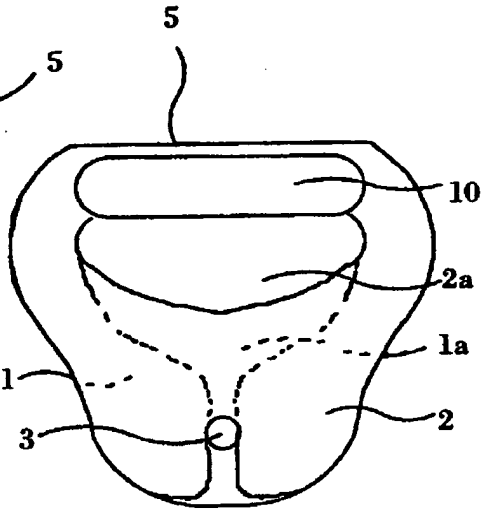

FIG.1B

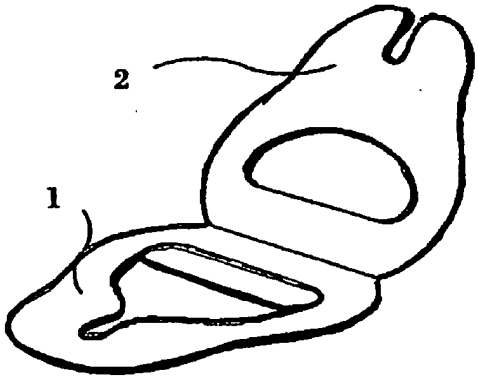

FIG.1C

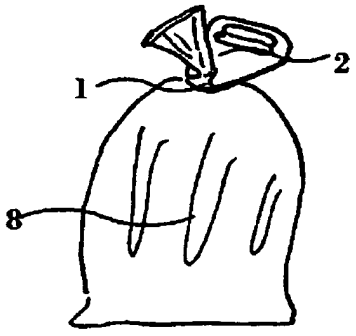

FIG.1D

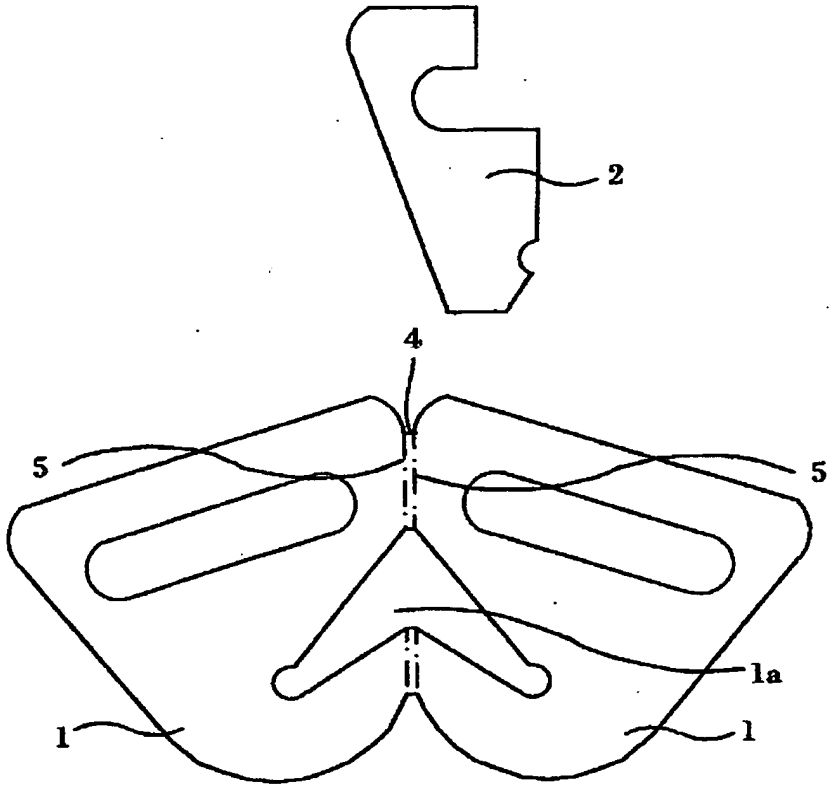

FIG.2A

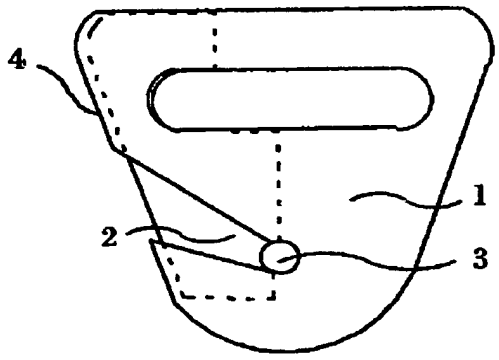

FIG.2B

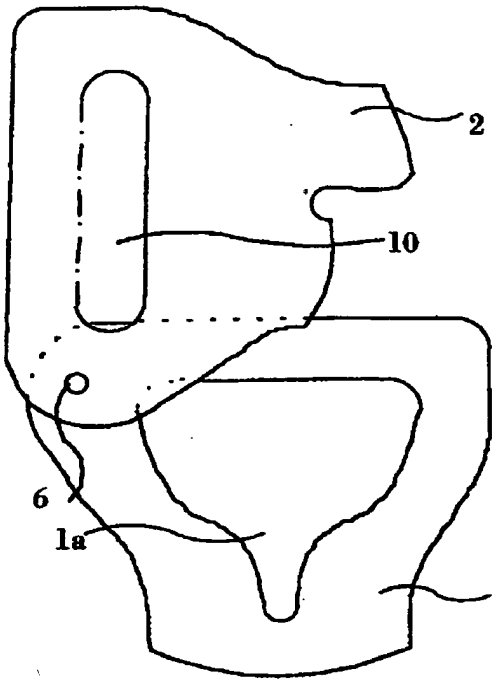

FIG.3A

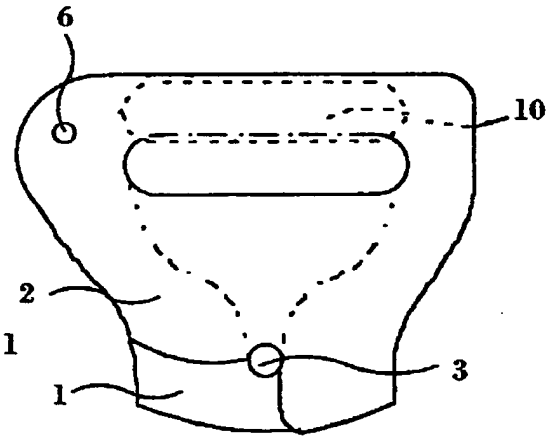

FIG.3B

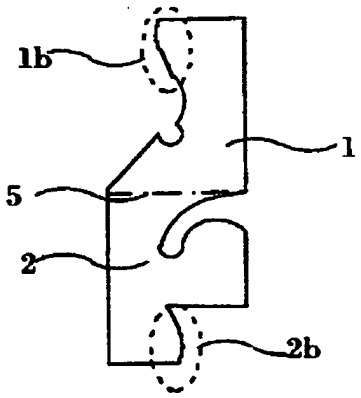

FIG.4A

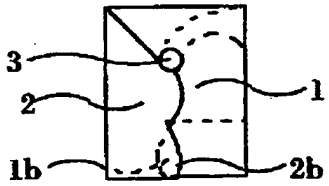

FIG.4B

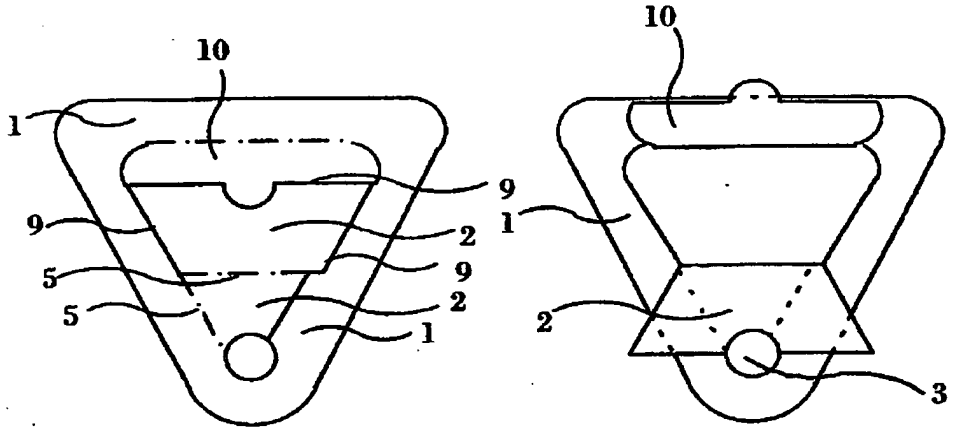

FIG.5A FIG.5B

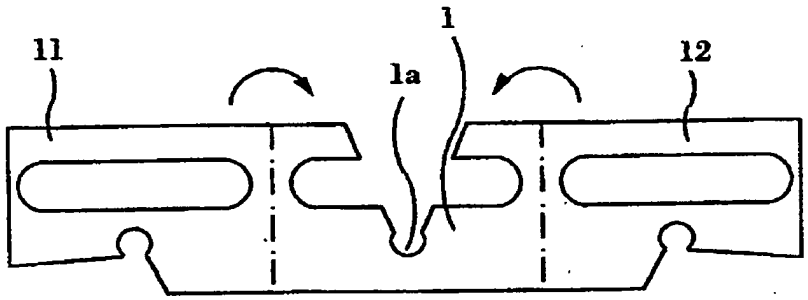

FIG.6A

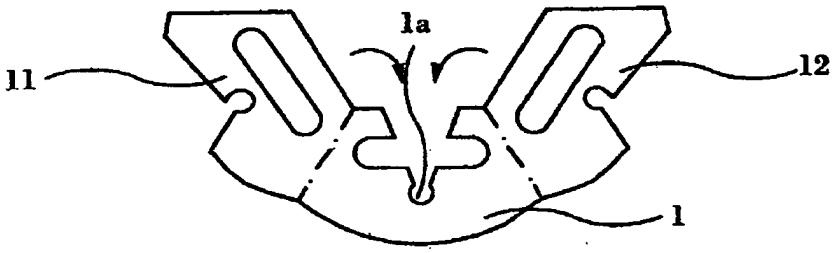

FIG.6B

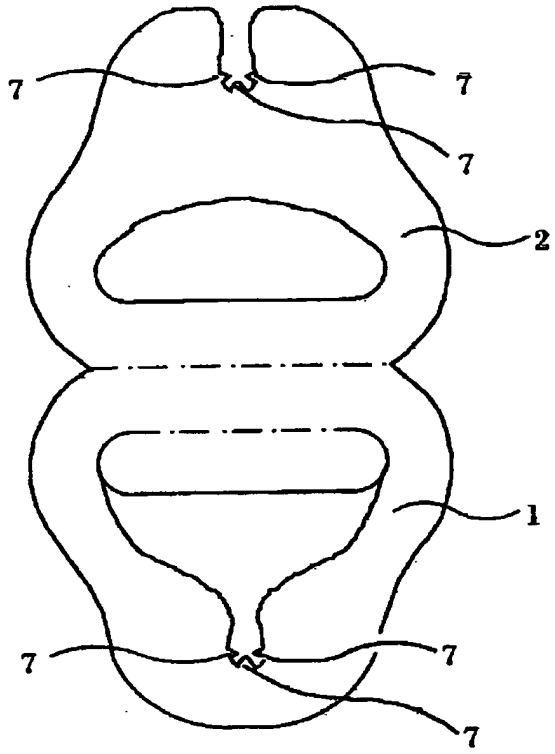

FIG.7

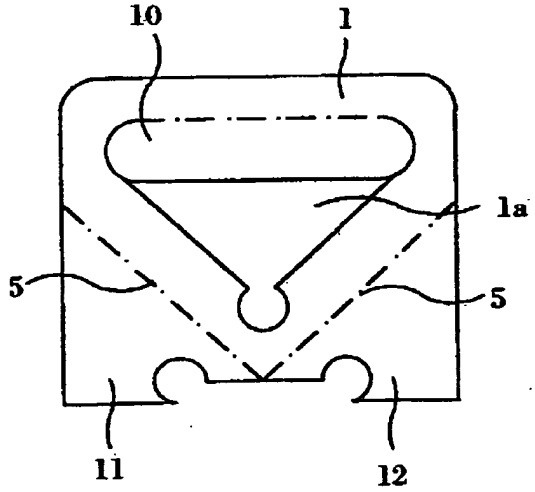

FIG.8

INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/IB 99/01377

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D33/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 270 345 A (MAX CO LTD) 9 March 1994 (1994-03-09) figures 1,2	1,15,16
A	US 5 311 646 A (EISCHEN) 17 May 1994 (1994-05-17) the whole document	1,15,16
A	US 3 822 441 A (PAXTON) 9 July 1974 (1974-07-09) cited in the application	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 December 1999	13/12/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl. Fax: (+31–70) 340–3016	Martens, L

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Int ional Application No
PCT/IB 99/01377

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